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(54) **Apparatus for magnetic resonance imaging and method of designing a gradient coil assembly**

(57) A gradient coil assembly generates substantially linear magnetic gradients across the central portion of an examination region. The gradient coil assembly includes primary x, y, and z-gradient coils which generate a gradient magnetic field (90) having a non-zero first derivative in and adjacent the examination region. Preferably, the gradient coil assembly includes secondary, shielding x, y, and z coils which generate a magnetic field which substantially cancels, in an area outside a region defined by the shielding coils, a fringe magnetic field generated by the primary gradient coils. The exist-

ence of a non-zero first derivative in and adjacent the examination region eliminates aliasing effects attributable to the non-unique gradient field values on either side of a rollover point (82). The non-unique values of the gradient magnetic field adjacent the rollover point caused structure near the rollover point to overlay each other. The unique non-linearity of the present gradient (90) adjacent the edges expands (magnifies) the image adjacent the edges. Because the expansion is unique, distortions at the edges are readily and accurately mapped back to linear.

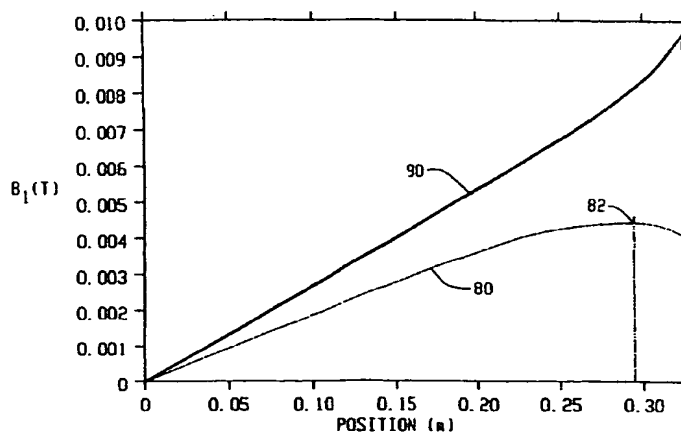


Fig. 3



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# EUROPEAN SEARCH REPORT

Application Number  
EP 00 30 8446

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The present search report has been drawn up for all claims			
Place of search MUNICH		Date of completion of the search 23 January 2003	Examiner Skalla, J
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons</p> <p>&amp; : member of the same patent family, corresponding document</p>			

EPO FORM 1500 03 82 (P04C01)

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